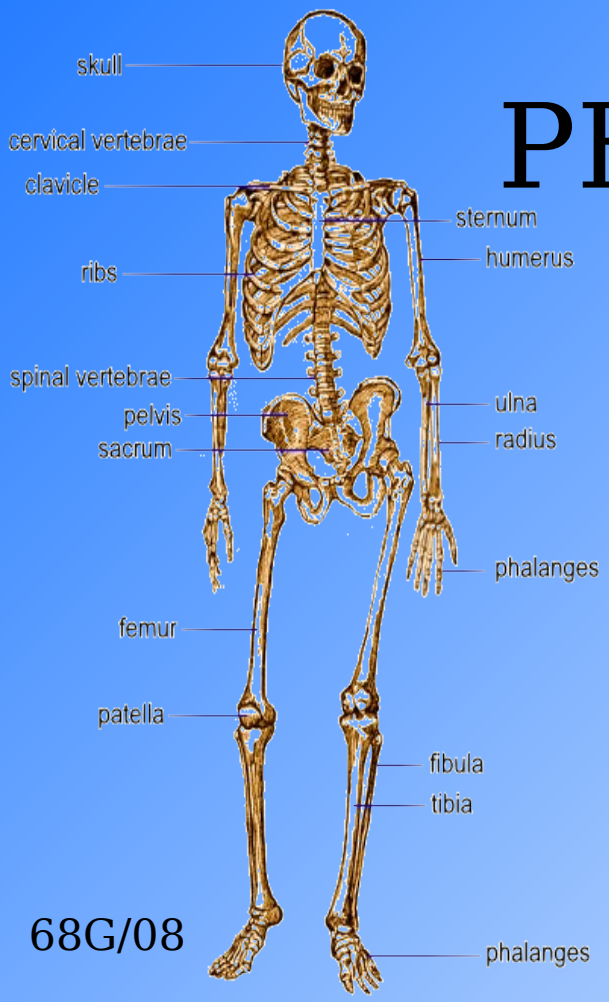
PATIENT ADMINISTRATION
CORNERSTONE
OF CONCERNED HEALTH CARE

ANATOMY & PHYSIOLOGY



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DEFINITION OF TERMS

- ***Anatomy***: the structure and arrangement of body parts.

- ***Physiology***: the functions of the body.

Classification of Units of the Body

- ***Cell:*** the basic unit of structure.
- ***Tissue:*** masses of cells with common function.
- ***Organ:*** different types of tissue-forming complex structure with a special function.

Classification of Units of the Body

- ***System:*** groups of organs arranged to perform one or more bodily functions.

- ***Organism:*** living entity composed of all the body systems.

Root Words (STEMS)

- ***Definition:*** Fundamental part of a word that defines a specific body part or organ, or tissue.

- ***Purpose:*** to combine with prefixes and suffixes to identify areas of the body.

Root Words (STEMS)

- ***CRANIO:*** skull or cranium
- ***VERTEBRO:*** vertebra or vertebral column
- ***THORACO:*** chest
- ***STERNO:*** sternum (breast bone)
- ***HUMERA:*** humerus (bone of the upper arm)
- ***COSTO:*** rib

Musculoskeletal System

- Permits movement (both voluntary and involuntary).
- Provides a framework for the body.
- Supports and protects the internal organs.
- Produces red blood cells (primarily in bone marrow).
- Provides for storage of calcium.

Musculoskeletal System

- ***Axial:*** includes bony framework of the head and trunk.

- ***Appendicular:*** includes bony framework of the extremities (arms and legs).

Musculoskeletal System

- **Stems for Musculoskeletal Systems**
  - **OSTEO:** bone
  - Outer shell is hard with soft spongy inner layer.
  - **Types of bones & examples:**
    - Long: femur, humerus, radius, ulna, etc.
    - Short: fingers and toes (phalanges)
    - Flat: scapula and sternum.
    - Irregular: vertebrae.

Musculoskeletal System

- **Specific bones.**
  - Maxilla: upper jaw bone.
  - Mandible: lower jaw bone.
  - Scapula: shoulder blade.
  - Radius: forearm (on thumb side)
  - Ulna: forearm (on small finger side).
  - Humerus: upper arm.

Musculoskeletal System

- Tibia: heavy bone of lower leg (on inner side of leg).
- Fibula: thinner bone of lower leg (on outer side of leg).
- Femur: thigh (longest bone in the body).

Musculoskeletal System

- **ARTHRO:** joint (Point where two or more bones attach together.)

  - **Classifications.**
    - Freely moveable.
    - Immovable/slightly moveable.

Musculoskeletal System

Synovial fluid:

The joint capsule secretes whitish fluid that works like oil in a machine, lubricating the joint surfaces to reduce friction to promote smooth operation and extend joint life.

Musculoskeletal System

- ***Specific joints***
  - Wrist: gliding (freely moveable).
  - Ankle: gliding (freely moveable).
  - Neck/head: pivot (freely moveable).
  - Knee: hinge (freely moveable).
  - Elbow: hinge (freely moveable).

Musculoskeletal System

- Hip: ball & socket (freely moveable).
- Shoulder: ball & socket (freely moveable).
- Skull: (immovable)
- Vertebrae: (slightly moveable).

Musculoskeletal System

- **CHONDRO:** cartilage (hard connective tissue which functions as a "shock absorber" between bones, at ear, at nose, etc.).
- **COSTO:** ribs
  - **Seven (7) pairs of true ribs attached to sternum.**
  - **Five (5) pairs of false ribs.**
    - **Three (3) of the false ribs are attached to the rib above.**
    - **Two (2) false ribs are not attached in the front (called "floating ribs").**

Musculoskeletal System

- ***MYELO:*** marrow (sometimes used in reference to the spinal cord).
- ***MYO:*** muscle
  - **Voluntary: skeletal muscle attached to bones normally under the control of person's will.**
  - **Involuntary.**
    - **Cardiac muscle produces the regular rhythm of the heart.**
    - **Smooth muscle forms the walls of organs, such as the intestines, blood vessels, etc.**
    - **Not normally controlled by the person's will.**

Musculoskeletal System

- ***TENDO:*** tendon (connects bone to muscle).

- ***LIGAMENT:*** holds bones together at joints.

Integumentary System

- ***Functions***
  - Protects deeper layers of the skin from infection-causing agents and drying.
  - Regulates body temperature.
  - Serves as the sensory organ for pain, touch, pressure, and temperature.
  - Excretes water and salt from the body in the form of perspiration.
  - Protects the finger tips and toes

Integumentary System

- Skin.
- Hair.
- Sudoriferous (sweat) glands.
- Sebaceous (oil) glands.
- Nails

Integumentary System

- ***Word Stems***
  - DERMA: skin (may be other variations of stem such as dermato, dermo, etc., depending upon what stem is joined with)
  - CUTIS: skin (less commonly used than . example: subcutaneous; also refers to deeper layer of skin).

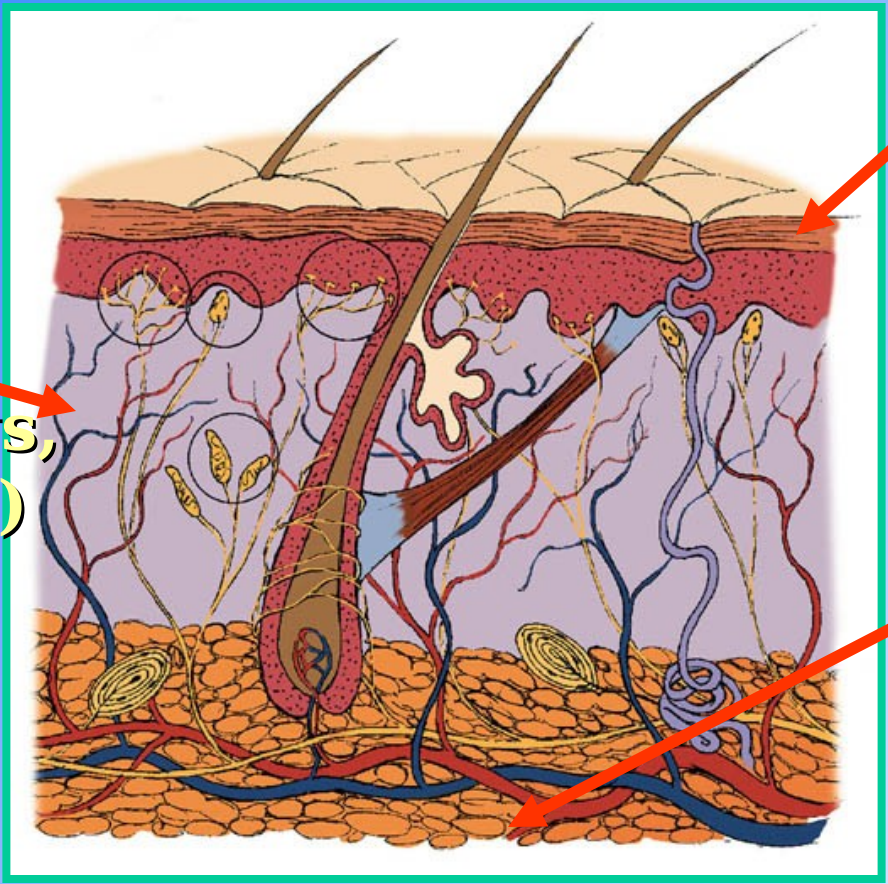
Integumentary System

- ONYCHO: nail (tough dead tissue after it grows from the nail bed).

- PHYTO: fungus.

PATIENT ADMINISTRATION CORNERSTONE OF CONCERNED HEALTH CARE

Integumentary System



Epidermis
(outermost la

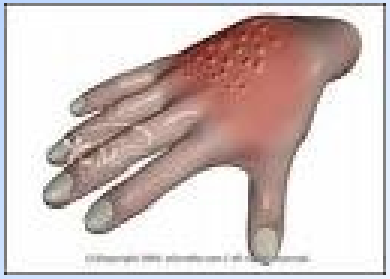
Dermis
(nerve endings, blood vessels)

Subcutaneo us
(elastic & fibrous tissues; fatty

Integumentary System

- ***Skin problems due to exposure***
  - First-degree Burns: superficial burns result in the skin damage limited to the top lay dermis.

  - Second-degree Burns: blisters (vesicles) caused by deeper penetration of heat.



Integumentary System

- Third-degree Burns: burns penetrate both the epidermis and the dermis which result in complete destruction of the skin tissue, usually leaving scar formations which may be altered by skin graft

Respiratory System

- Functions
  - Supply oxygen to tissue.
  - Remove carbon dioxide.

Respiratory System

- External respiration or lung breathing: oxygen from the outside air is inhaled into the lungs and enters the arterial blood, and carbon dioxide is exchanged from the venous blood to be exhaled to the outside air.
- Internal respiration or tissue breathing: gas exchanges that take place within the body cells; Oxygen in the blood transfers from the arteries and enters body cells as carbon dioxide enters the veins from body tissues.

Respiratory System

- Word Stems
  - RHINO: nose
  - NASO: nose
  - PHARYNGO--pharynx (serves two purposes: passageway for food & liquids into digestive system and as airway for the respiratory tract).
  - TRACHEO: upper windpipe (conducts air to and from the lungs).

Respiratory System

- BRONCHO: lower windpipe (two main air tubes entering lungs, one on each side).
- PNEUMO: air or lung (may be other variations of spelling depending on other ward parts).
- PULMO: lung (used less frequently).
- PNEA: breathing (air).
- LARYNGO: larynx (voice box)

Digestive System

- **Alimentary Canal**
- **Accessory organs**

Digestive System

- Alimentary Canal: a continuous passageway beginning at the mouth and terminating at the anus, approximately 30 to 32 feet in length.
- Purpose of the Alimentary Canal: to take food in and digest it, and to expel solid waste products from the body.

Digestive System

- Word stems for the <u>Alimentary Canal</u>
  - STOMATO: mouth (mouth receives the food and prepares it for digestion process).
  - LINGUA or GLOSSA: tongue (aids in chewing and swallowing. The taste buds found on surface of the tongue provide the means for tasting the difference between sweet, sour, bitter, and salt sensations).

Digestive System

- DENTO or ODONTO: teeth (cut and grind food in preparation for digestion).
- CHEILO: lip.
- GINGIVA: gums.
- ESOPHAGO: esophagus or gullet (a passageway, about 9 inches long, extending through the neck and chest to the stomach).

Digestive System

- GASTRO: stomach (provides a combination churn, digestive, and storage pouch for food; has a capacity of about 1/2 gallon for food and/or liquid).
- CARDIOESOPHAGEAL SPHINCTER: located between the esophagus and stomach to permit the one-way passage of food to the stomach.

Digestive System

- PYLORIC SPHINCTER: located at the bottom of the stomach between the stomach and the intestines (remains closed to retain the contents of the stomach until the digestive juices have caused digestion, then allows passage of waste).
- ENTERO: intestine (refers to the small intestine, usually, which is the chief organ that absorbs nutrients into the bloodstream.

Digestive System

- DUODENO: duodenum (the first 10 or 12 inches of the small intestine).
- JEJUNO: jejunum (the next 1 to 10 feet of the small intestine).
- ILEO: ileum (the third part, 8 to 9 feet, of the small intestine).
- COLO: colon (the fourth part, 4 to 5 feet intestine that is the storehouse for waste).

Digestive System

- PROCTO or ANO: rectum or anus (the temporary storage for indigestibles and unabsorbables).
- ANAL CANAL: section that leads to the outside of the body.

Digestive System

ACCESSORY ORGANS: produce fluids or enzymes which react to food products to aid in the digestion process.

Digestive System

- Word stems for the **Accessory organs**
  - HEPATO: liver
    - **largest glandular organ.**
    - **produces bile.**
    - **removes poisons absorbed from the intestines.**
    - **storage of sugar.**
    - **storage of certain vitamins.**
    - **manufactures of heparin, which prevents blood clotting.**

Digestive System

- **CHOLECYSTO: gallbladder**
  - **stores bile produced by the liver.**
  - **releases bile into the small intestine as needed in the digestion process.**
- **LAPARO: abdominal wall (outer layer of abdominal cavity)(loose reference).**

Digestive System

- **ABDOMINO or CELIO: abdomen (inner cavity).**
- **PANCREA: pancreas**
  - **produces pancreatic juices for digestion.**
  - **produces insulin.**

Circulatory System

- Heart
- Vascular (vessels) system.
- Blood

Circulatory System

- **Heart: a muscular, double pump which drives blood through the vessels.**
  - **Description.**
    - **Right side: pumps blood to the lungs where oxygen is received.**
    - **Left side: receives the oxygenated blood and pumps it to the rest of the body**

Circulatory System

– Four chambers.

- **Right atrium: receives blood, carried in veins, returning to the heart from areas of the body.**
- **Right ventricle: receives blood from the right atrium and sends it to the lungs.**
- **Left atrium: receives high-in-oxygen blood as it returns from the lungs.**
- **Left ventricle: pumps oxygenated bloods, away from the heart through arteries. to all parts of the body**

Circulatory System

Vascular system purpose: forms a closed system (with the heart) to route the flow of blood.

Circulatory System

- Component parts of the system.
  - Arteries: carry blood away from the heart's pumping chambers to the organs and body parts.
  - Capillaries: allow exchange between blood and body cells. These exchanges take place through tissue fluid.
  - Veins: drain the tissues and organs, and return the blood to the heart.

Circulatory Stems

- CARDIO/COR: Heart
- ANGIO/VASO: Vessel (common name for arteries, veins, and capillaries)
- ARTERIO: Arteries (Carry oxygenated blood AWAY from the heart to body parts)
- PHLEBO/VENA: Vein (Returns deoxygenated blood TO the heart)
- THROMBO: Clot
- AORTA: Largest artery in body

Circulatory System

- Blood
  - Total volume in healthy body: approximately 6 quarts.
  - Sudden loss of 2 quarts can cause death.
  - Gradual slow loss over several days or weeks could be 4 to5 quarts and not result in death; could be restored in 6 months

Circulatory System

- Content:
  - Plasma--90% water. (55% of blood)
  - Proteins.
  - Carbohydrates.
  - Lipids.
  - Salts.
  - Red blood cells (45% of blood)

Circulatory System

- Formed elements.
  - **Erythrocytes:**
    - **Bright red cells carries oxygen from lungs to tissues.**
    - **Dark red blood is returning from tissues and lacks oxygen. Oxygen has been given up and carbon dioxide is being carried.**
  - **Leukocytes:**
    - **white cells.**
    - **Most important function is to destroy disease-producing organisms (pathogens).**

Circulatory System

- Platelets
  - **Essential to clotting or coagulation of blood.**
  - **Fragments of cells which combine with fibrinogen to from clots.**

Circulatory System

- Word stems
  - HEMA: blood.
  - HEMATO: blood.
  - CYTE: cell.

Lymphatic System

- Transports excess fluid from tissues and returns it to the veins.
- Defends against infection by filtering particles from fluid.
- Removes cellular waste.

Lymphatic System

- Word stems
  - LYMPHO: lymph (tissue fluid).
  - SPLENO: spleen (filters blood and destroys bacteria).
  - PHAGO: to eat or destroy; Phagocytes destroy bacteria and other cells.

Endocrine System

- GLAND: a cell, tissue, or organ which produces and discharges a substance used elsewhere in the body (secretions) or is eliminated from the body (excretions).

- b. HORMONE: a chemical product of an organ that is transported by blood or other body fluids.

Endocrine System

- Specific glands.
  - Thyroid gland.
    - **Located in the neck; contains 2 lobes, one on either side of the voice box.**
    - **Produces thyroxine which regulates the production of heat and energy in the body.**
      - **The body requires an adequate supply of iodine in order for thyroxine to be produced.**

Endocrine System

- **A deficiency of iodine can result in a goiter (swelling in the neck due to an enlarged thyroid).**
- **Disorders may cause either hyperactivity or hypoactivity which may be manifested by extreme weight gain or weight loss.**

• **Influences growth metabolism.**

Endocrine System

- Pituitary gland (master gland).
  - Located in a depression just behind the optic nerve (about the size of a cherry).
  - Influences other glands to produce hormones.
  - **Influences skeletal growth**.
  - Either dwarfism or acromegaly can be caused by a disease or malfunction of the pituitary gland.
  - Secretes many different types of hormones.

Endocrine System

- Adrenal gland.
  - Located above the kidneys.
  - Produces adrenalin ("Fight or flight hormone")
  - Prepares the body for energy-expending action.

Endocrine System

- Islands of Langerhans.
  - Cells embedded in the pancreas.
  - Produces (secretes) insulin which is necessary for the body to properly use Glucose.

Common Diseases or Symptoms of Endocrine System

- **Diabetes mellitus: malfunction of Islands of Langerhans (pancreas) in secretion of insulin.**
- **Acromegaly: enlargement of the extremities**.
- **Glucosuria or glycosuria: sugar in the urine.**
- **Edema: swelling, excessive fluid in the tissues.**
- **Goiter: enlargement of thyroid gland**.

Stems associated with glands

- ADENO: Gland
- GLYCO/GLUCO: Sugar
- ACRO: Extremities

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Nervous System

- Definition: brain and spinal cord function which acts as the communication center for coordination of the body.

Nervous System

- PARTS
  - CEREBRUM: right and left cerebral hemispheres that control voluntary muscles, speech, hearing, and sight. (The highest functions of the brain are performed here.
  - CEREBELLUM: located at the back part of the brain where it aids coordination of voluntary muscles, helps maintain balance and aids in maintaining muscle tone.

Nervous System

- BRAIN STEM: deeper parts of the brain made up of the midbrain, pons, and medulla oblongata, which connects with the spinal cord through a large opening in the base of the skull.

Nervous System

- Word stems.
  - NEURO: nerve.
  - CEREBRO or ENCEPHALO: brain.
  - PSYCHO or MENTO or PHRENO: mind.
  - ESTHESIA: sensation or feeling.
  - PHOBIA: fear.

Sense Organs

- Closely related to nervous system.
- Sensory receptors are stimulated, causing a feeling or sensation which triggers nerve impulses.
- Five senses.
- **Smell.** **Taste.**
  Sight. **Hearing.**
  Touch.

Sense Organs

- Sensory Receptors.
  - **CHEMORECEPTORS: control smell or taste.**
  - **PAIN RECEPTORS: stimulated by tissue damage.**
  - **THERMORECEPTORS: stimulated by temperature change.**
  - **MECHANORECEPTORS: stimulated by changes in pressure or movement.**
  - **PHOTORECEPTORS: stimulated by intensity of light.**

Sense Organs

- Word stems
  - OTO: ear.
  - External: tympanic membrane sensitive to sound waves.
  - Middle: provides equalization of air pressure.
  - Inner: controls equilibrium (balance).

Sense Organs

- **TYMPANO or MYRINGO: eardrum.**
- **OPHTHALMO or OCULO: eye.**
  - **Has opening for light called called "Pupil".**
  - **Lens behind Pupil focuses light rays (focuses) on Retina.**
  - **Retina contains rods and cones.**
  - **Rods detect black and white.**
  - **Cones detect colors.**

Sense Organs

- OPTO: vision.
- BLEPHARO: eyelid.
- DACRYO or LACRIMA: tears.

Reproductive System

- Perpetuates life by allowing humans to reproduce.
- Essential for survival of the humans race, but not essential for individual life.

Reproductive System

- Word stems
  - ORCHIO: testes (produces spermatozoa).
  - OOPHORO: ovary (produces ova [egg])
  - SALPINGO: Fallopian tube (conveys ova; fertilization occurs here).
  - HYSTERO: uterus (embryo grows here).

Urinary System

- Functions
  - Removes water, salts, and nitrogenous wastes through excretion of urine.
  - Aids in maintaining concentrations of water and electrolytes.
  - Regulates the volume of body fluids.
  - Controls blood pressure by maintaining proper balance of those things in a, b, & c.

Urinary System

- Word stems.
  - **NEPHRO or RENA: kidney.**
    - **Filters waste from the blood.**
    - **Functional unit is the nephron.**
  - **URETERO: ureters.**
    - **One from each kidney.**
    - **Conducts waste (urine) from the kidney to the urinary bladder.**

Urinary System

- **CYSTO: bladder.**
  - **A reservoir which receives urine from the kidneys by way of a ureter.**
  - **Temporary storage holding about a pint of urine when moderately filled.**
- **URETHRO: urethra.**
  - **Tube extending from bladder to outside of body.**
  - **Conducts urine to outside of body.**
  - **In a male, the urethra is part of the reproductive system.**

Urinary System

- URO or URI: urine.

Miscellaneous stems

- PYO - Pus
- NATO/PARTA - Birth
- LIPO - Fat
- FEBRO - Fever
- NECRO - Dead
- EMESIS - Vomit
- TOXI - Poison
- LITH - Stone